

CLAIMS

1. Method for coding a picture sequence comprising a hierarchical temporal analysis (1) of a group of pictures performing a motion compensated temporal filtering of successive pairs of pictures (11) to supply low temporal frequency pictures and high temporal frequency pictures at different temporal decomposition levels, this analysis realizing, for a given temporal decomposition level and for a pair of low temporal frequency pictures, a motion estimation step (8) of a current picture B to a previous reference picture A to supply motion vectors then a motion compensated temporal filtering (11) of these pictures to supply a low temporal frequency picture (L) and a high temporal frequency picture (H) at a greater decomposition level, the said temporal filtering being replaced by an intra mode (16, 17) coding to obtain at least one low (L) or high (H) frequency picture if the current picture has a level of correlation with a previous picture lower than a threshold (10, 15), the low frequency pictures (L) obtained being thus scaled to be adapted, at the energy level, to the pictures obtained by the said motion compensated temporal filtering, characterized in that, among the low frequency picture and the final high frequency decomposed pictures obtained at the end of the analysis:

- it selects the low (L) or high (H) frequency pictures obtained by intra coding of a picture at a lower decomposition level with the additional condition, for the high frequency pictures, that this picture is derived itself from an intra coding.
- it calibrates the selected pictures by carrying out at least one reverse step of the scaling step, for their coding.

2. Method according to claim 1, characterized in that the number of reverse steps carried out corresponds to the number of successive intra coding operations of a low frequency picture (L) to arrive at the picture selected if this involves a low frequency selected picture, this number being decreased by one if it involves the high frequency selected picture (L).

3. Method according to claim 1, characterized in that it comprises, for the calculation of a low L or high H frequency image at a given temporal Level, a temporal filtering between the current picture and a following picture (16) of the following pair of pictures of the lower temporal level, if the correlation between the current picture and the previous picture is lower than a threshold (10) and if the correlation between the current picture and this following picture is greater than a threshold (15), the other H or L picture of the given temporal level being obtained by intra coding (16) and in that this filtering operation is assimilated with the intra coding and not with the temporal filtering for the selection step.

4. Method according to claim 1, characterized in that it assigns a picture number to each picture of the group of pictures, and in that it monitors these numbered pictures during the decomposition by attributing a counter for each number, this counter being updated at each step:

- the counter is increased each time a low frequency picture (L) is obtained in intra mode,
 - the counter remains unchanged each time a high frequency picture (H) is obtained in intra mode or during a temporal filtering with a following picture,
 - the counter is reset each time a picture is obtained by motion compensated temporal filtering with a previous picture,
- the reverse steps being carried out according to the value of the counters.

5. Method according to claim 1, characterized in that the high frequency pictures H and low frequency pictures L are obtained, during the motion compensated temporal filtering of two successive pictures A and B, from the following operations:

$$\begin{cases} H = \frac{B - MC_{A \leftarrow B}(A)}{\sqrt{2}} \\ L = \sqrt{2} \cdot A + MC_{A \leftarrow B}^{-1}(H) \end{cases}$$

MC corresponding to the motion compensation according to the B to A motion vector field, of the picture A or H.

and in that the pictures L and H are obtained, from intra coding, according to the formulas

$$5 \quad \begin{cases} H = B \\ L = \sqrt{2}.A \end{cases}$$

6. Method according to claim 3, characterized in that the pictures H and L are obtained by filtering with the following picture for H and by intra coding for L, according to the following formulas:

$$10 \quad \begin{cases} H = \frac{B - MC_{B \rightarrow C}(C)}{\sqrt{2}} \\ L = \sqrt{2}.A \end{cases}$$

MC corresponding to the motion compensation according to the B to C motion vector field, of the picture C.

7. Method according to claim 1, characterized in that the calibrated
15 pictures obtained by temporal analysis (1) are then processed by spatial analysis (3).

8. Method according to claim 1, characterized in that the level of
20 correlation is calculated by taking into account the number of connected pixels, that is, connected by a motion vector.

9. Decoding method of a sequence of coded images, the coding realizing an intermediate step of hierarchical temporal analysis of the MCTF type providing high frequency and low frequency pictures for their coding,
25 characterized in that it comprises a decoding step (18, 20) giving high frequency and low frequency decoded pictures, at least one reverse calibration step for pictures selected from the high and low frequency decoded pictures, the selection of the pictures and the number of reverse steps being dependent on an element of information associated with the

coded picture, to provide pictures to synthesise, and a temporal synthesis step (21) from decoded pictures not selected and said pictures to synthesise.

5 10. Method according to claim 9, characterized in that the information associated is the value of a counter assigned to the picture during the coding.

10 11. Coder for the implementation of the method according to claim 1, comprising a temporal analysis circuit (1) using the motion compensated temporal filtering and the intra coding, characterized in that the circuit selected, among the low frequency picture and the final high frequency decomposed pictures obtained at the end of analysis, the pictures obtained by an intra coding of a picture at the lower decomposition level, with the additional condition, for the high frequency pictures, that this picture is
15 derived itself from an intra coding and in that it carries out at least one scaling step for the pictures selected.

20 12. Decoder for the implementation of the method according to claim 9, comprising a decoding circuit to provide high and low frequency decoded pictures and a temporal synthesis circuit (21) of pictures to synthesise, characterized in that it also comprises means to perform a reverse calibration of selected high and/or low frequency decoded pictures to provide pictures to be synthesized, the selection of the pictures and the number of reverse calibrations being dependent on an element of information
25 associated with the picture to decode and received by the decoder.